CLAIMS

1. A charger that charges a secondary cell through a converter for constantly controlling input electric power from a cell having relatively large output impedance when electric power is supplied, such as a fuel cell or a solar cell as an input source, comprising:

a current control circuit having the secondary cell provided at an output thereof, that is connected to the secondary cell, and supplies a charging current flowing into the secondary cell as a current value which is obtained from a control amount necessary for keeping an output voltage of the converter at a dropping voltage to be set.

2. The charger according to Claim 1, wherein, when charging to the secondary cell is started, the current control circuit performs constant current charging in which the charging current flowing into the secondary cell is used as a current value determined according to an input electric power value, and at an end period of the charging when the voltage of the secondary cell reaches approximately an output voltage, the current control circuit stops performing constant control of the input electric power and detects a rise in an input voltage, thereby stopping the charging.

3. The charger according to Claim 2, wherein the current control circuit includes a comparing unit which compares the output voltage of the converter with a reference voltage and outputs a control amount, and a constant current control unit that performs constant current control on the secondary cell, on the basis of the control value.

4. The charger according to Claim 2, wherein the current control circuit includes a comparing unit which compares the output voltage of the converter with a reference voltage and outputs a control amount, a semiconductor switch that is turned on and off according to the control amount, and a constant current control unit that performs constant current control by turning on and off the semiconductor switch.

5. The charger according to Claim 4, wherein the constant current control unit includes a first level conversion unit which is connected to an output end of the comparing unit, the first level conversion unit being connected to a positive output end of the converter and a control terminal of the semiconductor switch, and
a second level conversion unit which is connected to an output terminal of the semiconductor switch, the second

level conversion unit being connected to a negative output end of the converter and a control terminal of a second semiconductor switch, wherein an output terminal of the second semiconductor switch is connected to an input terminal of the secondary cell, and when charging to the secondary cell is started, the current control circuit performs the constant current charging in which the charging current flowing into the secondary cell is used as a current value which is determined according to an input electric power value, and at an end period of charging when the voltage of the secondary cell reaches approximately an output voltage, the current control circuit stops performing the constant control of the input electrical power and detects a rise in the input voltage, thereby stopping the charging.

6. The charger according to Claim 1, wherein the charger has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

7. The charger according to Claim 2, wherein the charger has functions of detecting a voltage of the input

source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

8. The charger according to Claim 3, wherein the charger has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

9. The charger according to Claim 4, wherein the charger has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

10. The charger according to Claim 5, wherein the charger has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

11. A DC-DC converter that uses, as an input source, a cell such as a fuel cell or a solar cell, having relatively large output impedance when electric power is supplied, comprising:

the charger according to Claim 1,

wherein a current control circuit is connected to a secondary cell in which the secondary cell and a load are connected in parallel to an output end of the a current control circuit, and

when a current flowing through the load decreases, the current control circuit increases a charging current flowing into the secondary cell, and

when the current flowing through the load increases, the current control circuit decreases the charging current flowing into the secondary cell, thereby keeping an output voltage at a dropping voltage to be set.

12. The DC-DC converter according to Claim 11, wherein the current control circuit includes a comparing unit which compares the output voltage of the DC-DC converter with a reference voltage and outputs the control amount, and a constant current control unit that performs constant current control on the secondary cell on the basis of the control value.

13. The DC-DC converter according to Claim 12, wherein the constant current control unit performs the constant current control using a semiconductor switch.

14. The DC-DC converter according to Claim 13, wherein the constant current control unit includes a first level conversion unit which is connected to an output end of the comparing unit, the first level conversion unit being connected to a positive output end of the DC-DC converter and a control terminal of the semiconductor switch, and
a second level conversion unit which is connected to an output terminal of the semiconductor switch, the second level conversion unit being connected to a negative output end of the DC-DC converter and a control terminal of a second semiconductor switch, wherein an output terminal of the second semiconductor switch is connected to an input terminal of the secondary cell, when a current flowing through the load decreases, the current control circuit increases a charging current flowing into the secondary cell, and when the current flowing through the load increases, the current control circuit decreases the charging current flowing into the secondary cell, thereby keeping the output voltage at a dropping voltage to be set.

15. The DC-DC converter according to Claim 11, wherein the DC-DC converter has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

16. The DC-DC converter according to Claim 12, wherein the DC-DC converter has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

17. The DC-DC converter according to Claim 13, wherein the DC-DC converter has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of controlling the input voltage to be constant on the basis of the control value.

18. The DC-DC converter according to Claim 14, wherein the DC-DC converter has functions of detecting a voltage of the input source, of comparing the input voltage with a voltage control input that is arbitrarily set, and of

controlling the input voltage to be constant on the basis of the control value.